

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND REGION
ONE CONGRESS STREET, SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023**

FACT SHEET

**DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES PURSUANT TO
THE CLEAN WATER ACT (CWA)**

NPDES PERMIT NO.: **NH0023361**

PUBLIC COMMENT PERIOD: **June 26, 2007 - July 25, 2007**

PUBLIC NOTICE NO.: **NH-013-07**

NAME AND ADDRESS OF APPLICANT:

**Newington Energy, L.L.C.
200 Shattuck Way
Newington, New Hampshire 03801**

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

**Newington Energy Facility
200 Shattuck Way
Newington, New Hampshire 03801**

RECEIVING WATER: **Piscataqua River (USGS Hydrologic Basin Code: 01060003)**

CLASSIFICATION: **Class B**

SIC CODE: **4911** NAICS Code(s): **221112**

CURRENT PERMIT ISSUED: **7-7-2000**
EXPIRED: **9-5-2005**
RE-APPLICATION: **3-01-2005**

TABLE OF CONTENTS

1.	Proposed Action, Type of Facility, and Discharge Location	3
2.	Description of Discharge	4
3.	Receiving Water Description	4
4.	Limitations and Conditions	4
5.	Permit Basis: Statutory and Regulatory Authority	4
6.	Explanation of the Permit's Effluent Limitation(s)	7
6.1	Facility Information	7
6.2	Descriptions of Permitted Outfalls	8
6.3	Derivation of Effluent Limits under the CWA and/or State of New Hampshire Water Quality Standards	10
6.3.1	Outfall Location 001	10
6.3.2	Outfall Location 003	18
6.3.3	Internal Outfall Locations 004 and 005	18
6.4	Cooling Water Intake Structure Requirements under CWA § 316(b)	19
6.4.1	Biological Monitoring Results	21
6.4.2	BTA Determination	24
6.5	Stormwater Requirements	24
7.	Essential Fish Habitat	24
8.	Endangered Species Act	31
9.	Monitoring	33
10.	Antidegradation	33
11.	State Certification Requirements	33
12.	Comment Period, Hearing Requests, and Procedures for Final Decisions	34
13.	EPA Contact	35
<u>Table 1:</u> Newington Energy's Outfall Locations		9
<u>Table 2:</u> EFH Species Located in the Vicinity of Newington Energy		25-26

Attachment A-1 :shows the intake and discharge locations

Attachment A-2 :a map showing the geographical location of the facility

Attachment B :schematic drawing of the flow of water at the facility

Attachment C1-3 :describes the discharge, based on the applicants quantitative discharge data

1. Proposed Action, Type of Facility, and Discharge Location

Newington Energy Facility, located in Newington, New Hampshire, is a 525 megawatt (MW) natural gas and #2 fuel oil fired, combined cycle electrical generation facility (referred to hereafter as either Newington Energy, NEF, Facility, or Station). The Station is an “intermediate” facility, having an average yearly capacity utilization rate of 53.4%. The Station has two, gas-fired combustion turbine generators (CTG) with two corresponding heat recovery steam generators (HRSG) and a condensing steam turbine generator. Commercial operation began in November, 2002. There are also two small package boilers which are used for heat and to pre-heat fuel.

Newington Energy Facility’s current National Pollutant Discharge Elimination System (NPDES) Permit allows the withdrawal of cooling water from and the discharge of pollutants to the Piscataqua River. Attachment A-1 shows the intake and discharge locations. Mechanical draft cooling towers are used to cool and recirculate non-contact condenser cooling water, thus reducing the amount of water removed from the river compared to once-through cooling systems. NEF is permitted to discharge intake screen wash water and cooling tower wastewater mixed with other internal process wastes. Storm water discharges to the Piscataqua River are covered by the facility’s Multi-Sector General Storm Water Permit. #NHR05A704.

Under CWA §§ 301(a), 316 and 402, Newington Energy Facility’s pollutant discharges and cooling water withdrawals must receive authorization from a National Pollutant Discharge Elimination System (NPDES) permit issued by the U.S. Environmental Protection Agency (EPA, EPA-New England, Region I, the Region). EPA may not issue a permit for NEF unless the New Hampshire Department of Environmental Services (NH DES) either certifies that the effluent limitations and/or conditions contained in the permit are stringent enough to assure, among other things, that the discharge will not cause the receiving water to violate the New Hampshire Surface Water Quality Regulations (NH-Standards) or waives its right to certify as set forth in 40 CFR §124.53. EPA first issued the Station federal permit number NH0023361 on July 7, 2000. This permit expired on September 5, 2005. The permit was administratively continued, however, because the Station timely applied for permit reissuance. As a result, Newington Energy Facility remains subject to the existing permit until EPA issues it a new one.

EPA received Newington Energy’s application for reissuance of the Facility’s NPDES permit on March 1, 2005. In response to a letter from EPA that delineated deficiencies in the application, supplemental information was received April 25, 2005 and June 3, 2005. Newington Energy requested three alterations to its NPDES permit and provided additional supporting documentation not received with the permit application. The changes requested are to increase the permitted limits for salinity, temperature and flow. These changes are discussed in detail in Sections 6.3.1 and 6.4.1 of this Fact Sheet. EPA currently intends to reissue the Facility’s NPDES permit. This Draft Permit proposes to continue to authorize the intake of cooling water and discharge of cooling and process water.

2. Description of Discharge

Refer to Section 6.2 of this Fact Sheet for a description of the discharges associated with each outfall location. A schematic drawing of the flow of water at the facility and the various discharges from the facility is presented on Attachment B. Attachment C describes the discharge, based on the applicant's quantitative discharge data.

3. Receiving Water Description

Newington Energy Facility withdraws water from and discharges to the lower Piscataqua River. The Piscataqua is a tidal river approximately 13 miles long, which empties into Portsmouth Harbor/ Atlantic Ocean. The tide in this river is semi-diurnal with an average period of 12.4 hours. The lower portion of the Piscataqua River has been characterized as a well mixed estuary. (Newington Energy Facility 1998 NPDES Permit Application, TRC, p. 4-5) Tidal flushing requires six to 12 tidal cycles (3 to 6 days) and tidal mixing forces cause the water column vertically well mixed.

The Piscataqua River is classified as a Class B water body pursuant to the State of New Hampshire Surface Water Quality Regulations (N.H. Code of Administrative Rules, PART Env-Ws 1703.01) and N.H. RSA 485-A:8. Class B waters are "considered as being acceptable for fishing, swimming and other recreational purposes and , after adequate treatment, for use as water supplies." (RSA 485-A:8, II)

Section 303(d) of the Federal Clean Water Act (CWA) requires states to identify those water-bodies that are not expected to meet surface water quality standards after the implementation of technology-based controls and, as such require the development of total maximum daily loads (TMDL). The section of Piscataqua River that NEF discharges to is on the 2004, CWA 303(d) list for enterococcus, polychlorinated biphenyls (PCB's), mercury and dioxin.

4. Limitations and Conditions

Proposed effluent discharge limits, cooling water intake and monitoring requirements, and implementation schedule (if required) may be found in Part I (Effluent Limitations and Monitoring Requirements) of the Draft Permit.

5. Permit Basis: Statutory and Regulatory Authority

The CWA prohibits the discharge of pollutants from point sources to waters of the United States without authorization from a NPDES permit, unless the CWA specifically exempts a particular type of point source discharge from requiring a permit. The NPDES permit is the mechanism used to apply-technology and water quality-based effluent limitations and other requirements including monitoring and reporting directly to particular facilities. This draft NPDES permit was developed in accordance with the CWA, EPA regulations promulgated thereunder, and any other applicable federal and state legal requirements. The regulations governing the EPA NPDES permit program are generally found at 40 C.F.R. Parts 122, 124, 125, and 136.

When developing permit limits, EPA must apply both technology-based and water quality-based requirements. To the extent that both may apply, whichever is more stringent governs the permit limits. Criteria and standards for the imposition of technology-based treatment requirements in permits under Section 301(b) of the CWA, including the application of EPA-promulgated effluent limitations and case-by-case determinations of effluent limitations under Section 402(a)(1) of the CWA, are set out in 40 C.F.R. Part 125, Subpart A. Development of water quality-based permit limits is addressed in, among other provisions, CWA §§ 301(b)(1)(C) and 401, as well as 40 C.F.R. §§ 122.4, 122.44, 124.53 and 124.55.

Technology-based treatment requirements represent the minimum level of control that must be imposed under Sections 301(b) and 402 of the CWA (see 40 C.F.R. §125 Subpart A) to meet best practicable control technology currently available (BPT) for certain conventional pollutants, best conventional control technology (BCT) for conventional pollutants, and best available technology economically achievable (BAT) or new source performance standards (NSPS) for toxic and non-conventional pollutants. The technology-based guidelines for industrial dischargers can be found at 40 CFR Parts 400 - 471 and represent the minimum level of control that must be imposed under section 301(b) and 402 of the CWA (See 40 CFR Part 125, Subpart A).

In general, for facilities like Newington Energy, technology-based effluent limitations must be complied with as expeditiously as practicable, but in no case later than either three years after the date such limitations were established or March 31, 1989, whichever comes first [see 40 C.F.R. §125.3(a)(2)]. Since the statutory deadline for meeting any applicable technology-based effluent limits has already passed, NPDES permits must require immediate compliance with any such limits included in the permit.

In the absence of published technology-based effluent guidelines, the permit writer is authorized under Section 402(a)(1)(B) of the CWA to establish appropriate technology-based effluent limitations (*e.g.*, BAT limits) on a case-by-case basis using best professional judgement (BPJ). [See also 40 C.F.R. § 125.3.]

Water quality-based limitations are required in NPDES permits when EPA and the State determine that effluent limits more stringent than technology-based limits are necessary to maintain or achieve state or federal water quality standards. See CWA §§ 301(b)(1)(C) and 401. State Water Quality Standards provide a classification for all the water bodies in the state and specify the “designated uses” and numeric and narrative water quality criteria that water bodies in each classification should be able to achieve. The New Hampshire Surface Water Quality Regulations (NH-Standards) include a narrative statement that prohibits the discharge of any pollutant or combination of pollutants in quantities that would be toxic or injurious to human health or aquatic life. In addition, the State has adopted EPA’s numerical criteria for specific toxic pollutants and toxicity criteria. State Water Quality Standards also contain antidegradation requirements to ensure that once a use is attained it will not be degraded. Permit limits must then be devised so that discharges and cooling water withdrawals do not cause violations of these Water Quality Standards.

The permit must limit any pollutant or pollutant parameter (conventional, non-conventional, toxic and whole effluent toxicity) that is or may be discharged at a level that causes, or has the "reasonable potential" to cause or contribute to, an excursion above any water quality criterion. See C.F.R. § 122.44(d)(1). An excursion would occur if the projected or actual in-stream concentration exceeds the applicable criterion. In determining "reasonable potential," EPA considers: (1) existing controls on point and non-point sources of pollution; (2) pollutant concentrations and variability in the effluent and receiving water as determined from the permit application, the permittee's monthly Discharge Monitoring Reports (DMRs), and State and Federal Water Quality Reports; (3) the sensitivity of the species to toxicity testing; (4) the known water quality impacts of processes on wastewater; and, where appropriate, (5) the dilution of the effluent that would be provided by the receiving water.

In accordance with State regulations [N.H. Code of Administrative Rules, PART Env-Ws 1705.02], the flow used to calculate permit limits for facilities on rivers or streams is based on a known or estimated value of the annual seven (7) consecutive-day mean low flow at the 10-year recurrence interval (7Q10) for aquatic life and human health (non-carcinogens only) in the receiving water at a point just upstream of the outfall. Furthermore, 10 percent (%) of the receiving water's assimilative capacity is held in reserve for future needs in accordance with New Hampshire's Surface Water Quality Regulations Env-Ws 1705.01. The current set of New Hampshire Surface Water Quality Regulations were adopted on December 3, 1999, and became effective on December 10, 1999.

When using chemical-specific numeric criteria to develop permit limits, both the acute and chronic aquatic-life criteria, expressed in terms of maximum allowable in-stream pollutant concentrations, are used. Acute aquatic-life criteria are considered applicable to daily time periods (maximum daily limit) and chronic aquatic-life criteria are considered applicable to monthly time periods (average monthly limit). Chemical-specific limits are allowed under 40 C.F.R. § 122.44(d)(1) and are implemented under 40 C.F.R. § 122.45(d). In the Draft Permit for Newington Energy Facility, the Region has established, pursuant to 40 C.F.R. § 122.45(d)(1), maximum daily and average monthly discharge limits for specific chemical pollutants to satisfy Water Quality Standards.

Narrative criteria from the State's Water Quality Standards often provide a basis for limiting toxicity in discharges where: (1) a specific pollutant can be identified as causing or contributing to the toxicity but the state has no numeric standard; or (2) toxicity cannot be traced to a specific pollutant (see 40 C.F.R. § 122.44(d)(1)).

Under CWA § 401, EPA may not issue a NPDES permit unless it first obtains a certification from the state confirming that all water quality standards will be satisfied or the state waives its certification rights. If the state issues a certification with conditions, then the permit must conform to the conditions. See 40 C.F.R. §§ 124.53 and 124.55.

The Draft Permit's effluent monitoring requirements have been established under the authority of CWA §§ 308(a) and 402(a)(2) and in accordance with 40 C.F.R. §§ 122.41(j), 122.44(i) and 122.48. The monitoring program in the permit specifies routine sampling and analysis which will

provide continuous, representative information on the levels of regulated materials in the waste water discharge streams. The approved analytical procedures are to be found in 40 C.F.R. Part 136 unless other procedures are explicitly required in the permit.

The CWA's anti-backsliding requirements prohibit a NPDES permit from being renewed, reissued or modified with less stringent limitations or conditions than those contained in the previous permit unless an exception to the anti-backsliding requirements applies. See CWA §§ 402(o) and 303(d)(4) and 40 C.F.R. §122.44(l)(1) and (2). EPA's anti-backsliding provisions found at 40 C.F.R. §122.44(l) generally prohibit the relaxation of permit limits, standards, and conditions.

In addition to technology-based and water quality-based requirements, limits for thermal discharges may potentially be based on a variance from such requirements under CWA § 316(a). The permittee has not, however, sought relaxation of those limitations under a § 316(a) variance.

For the derivation of the thermal discharge limit, see Section 6.3.1 of this Fact Sheet.

Permit limits on cooling water withdrawals may be imposed in a NPDES permit under CWA § 316(b). These requirements are discussed in further detail in Section 6.4 of this Fact Sheet.

The permit must also satisfy the requirements of the essential fish habitat (EFH) provisions of the 1996 Amendments (PL 104-297) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq. (1998)) and the Endangered Species Act (ESA). These requirements are discussed further in Section's 7.0 and 8.0 of this Fact Sheet, respectively.

6. Explanation of the Permit's Effluent Limitation(s)

6.1 Facility Information

Newington Energy Facility is located roughly 1000 feet southwest of the Piscataqua River in Newington, New Hampshire. See Attachment A-2 for a map showing the geographical location of the facility. The station uses natural gas or #2 oil as fuel to generate 525 megawatts (MW) of electric power. This facility is a combined cycle power plant. Combined cycle means that electricity is generated using two methods; the gas cycle and the steam cycle. Both methods are combined for higher efficiency. First, gas is burned in two gas turbines which directly turns generators to create electricity (called combustion turbine generators (CTG)). The hot exhaust gases exiting the gas turbines are used to heat water to produce steam in two corresponding heat recovery steam generators (HRSG's). Natural gas is also used for supplemental firing of the HRSG's. Super-heated steam then powers a condensing steam turbine generator. The turbine exhaust steam is directed to a surface condenser (non-contact) to convert the steam back to water for reuse in the boilers.

The facility uses a fiberglass constructed, 10-cell mechanical draft cooling tower to eliminate waste condenser heat through the process of water evaporation. The facility intakes a maximum of 10.8 million gallons per day (MGD) of water from the Piscataqua River for cooling tower

make-up. The cooling tower is equipped with a plume abatement system to prevent the formation of ground-level fog and icing during the winter.

The 30-foot by 70-foot cooling water intake structure (CWIS) is located between 200-255 feet off-shore in the Piscataqua River (depending on the tide). The intake is equipped with two intake bays containing a 5,000 gallons per minute (gpm) variable speed pump in each bay resulting in a total design capacity of 14.4 MGD. Although the total design flow is 14.4 MGD, the total actual maximum flow is reduced to 10.8 MGD due to pressure changes and friction. Generally, only one pump is used at a time and occasionally two pumps are used. Inside the intake channels is a cross over sluice gate. This gate is normally kept open, which results in lower through screen/approach velocities because of the increase screen area available. The intake bay openings are 5 feet x 6 feet in size and located 4.5 feet below the mean low water level and 5 to 6 feet off the bottom of the river. Each intake bay is equipped with vertically rotating, 1/4 inch x 1/2 inch mesh, modified Ristroph screens. The screens are designed to rotate based on pressure differentials. Through-screen velocity has been calculated to be at or below 0.5 feet per second (see March 1, 2007 email from Alan Douglass, NEF to Sharon DeMeo, EPA). Low pressure (15 psi) spray wash is used to remove trapped organisms from the intake screens. These organisms are returned directly to the river (below low tide level) via a covered sluiceway. High pressure spray (60 psi) removes all remaining material from the screens to a dumpster for off-site removal. The dumpster drains back to the intake bays. The spray wash pump capacity is 150 gpm. Therefore, a fraction of that amount is the low pressure wash which is discharged to the river through Outfall 003 when the screens are rotated.

Low volume wastes (as defined in 40 C.F.R. 423.11) are directed to the cooling tower basin (internal Outfall 002) to minimize total water demand and limit wastewater discharge requirements. Low volume wastes include boiler blowdown, treated demineralizer waste, floor drains, vacuum pump seal water, and evaporative cooler blowdown.

Laboratory wastewater is considered low volume waste. However it is removed for off-site disposal. In addition, wastes generated during acid cleaning of the boilers, off-line compressor cleaning (turbine washing) and cleaning of other types of process equipment are hauled for off-site treatment and disposal. Therefore, the Draft Permit includes a provision that prohibits the discharge of chemical metal cleaning wastes (as defined in 40 C.F.R. 423).

Currently, a maximum 3.5 MGD of heated cooling tower blowdown containing low volume waste is discharged to the Piscataqua River through a submerged multi-port diffuser (Outfall 001) located approximately 700 feet off-shore (500 feet from the intake structure). The cooling tower operates at two cycles of concentration. A schematic drawing of the flow of water at the facility and the various discharges from the facility is presented in Attachment B.

6.2 Descriptions of Permitted Outfalls

The table below lists and describes the facility's permitted outfalls and proposed draft permitted outfalls:

Table 1: Newington Energy's Outfall Locations

Outfall Number/Location	Description
001 - Submerged, off-shore, multi-port diffuser	Cooling tower blowdown including low volume wastes
002 - Internal outfall (discharged to cooling tower from four locations) - <i>Removed</i> from Draft Permit	Low volume waste from boiler blowdown sump, neutralization tank and clean water sump during rain events and condensate line
003 - Intake screen spray wash	Initial low pressure screen wash to return marine life back to the river
004 - Internal outfall (discharge to cooling tower) - <i>New</i> outfall location on Draft Permit	Low volume waste from boiler blowdown sump
005 - Internal outfall (discharge to cooling tower) - <i>New</i> outfall location on Draft Permit	Low volume waste from neutralization tank

Outfall 001

Outfall 001 consists of a 14" diameter pipe which extends from the basin of the cooling towers to a submerged diffuser 700 feet off-shore in the Piscataqua River. The diffuser is approximately 66 feet in length with six equally spaced 4" diameter openings (a.k.a. ports). The blowdown flow from the cooling tower basin ranges from 1200 gpm to 2600 gpm.

The effluent discharged through Outfall 001 consists of cooling tower blowdown mixed with internal process wastewater (low volume wastes). See Internal Outfall Locations 002, 004 and 005 below for more information regarding the low volume wastes.

Each evening, at midnight, the discharge valve is closed and the towers are shocked with 13-15 percent sodium hypochlorite (to prevent biofouling) for approximately two to four hours. Periodic sampling and on-site testing is conducted until the free available chlorine level is below detection level. Discharging then resumes. The Station keeps daily logs of testing results.

Samples collected for permit compliance are taken from the cooling tower basin, upstream of the recirculating pumps. Temperature is continuously monitored in the basin and at the discharge side of the recirculating pumps. The higher of the two readings is used to maintain compliance with the permit limit.

The cooling tower is also equipped with a continuous recording pH meter and sulfuric acid feed system. The acid feed system is calibrated to maintain the pH of the circulating water within the allowable range.

Internal Outfalls 002, 004 and 005

Prior to construction of the facility, the existing permit was developed assuming that all low volume streams would combine before discharging into the cooling tower. However, the effluent collected as Outfall 002 in the existing permit consists of several internal low volume waste streams and condensate that discharge at separate locations into the cooling tower. The permittee collects samples from each of the following: boiler blowdown sump, “clean water” sump, neutralization tank and condensate line. Total suspended solids (TSS) samples are flow proportionally combined prior to analysis and oil & grease (O&G) samples are analyzed separately but the results are flow proportionately calculated.

For this Draft Permit, Outfall 002 has been removed from the Draft Permit and replaced with two new outfalls, 004 and 005. Outfall 004 consists of all low volume waste that enters the boiler blowdown sump. Outfall 005 consists of all water treatment, low volume wastes that enter the neutralization tank. Attachment B is a water balance line diagram that shows the sources of wastewater to each location.

Normally, the clean water sump discharges to the Town of Newington’s publically owned treatment works (POTW) via the sanitary sewer system. During a heavy rain event, stormwater from a fuel loading area enters the “clean water” sump. When the flow limit to the POTW is reached, the clean water sump discharge is diverted to the cooling tower. NEF has decided to cover the storm drain during rain events so there will no longer be a flow of stormwater to the cooling tower. Therefore, this Draft Permit does not authorize the discharge of wastewater from the clean water sump to the cooling tower.

Outfall 003

Outfall 003 is the fish return sluiceway. The discharge at this location consists only of the intake screen, low-pressure spray wash water and any biomass that is sprayed off the screens. The source of the spray wash water is the intake well. Contrary to what may have been proposed before the facility was built, heated backwashing at this location does not and can not ever occur.

6.3 Derivation of Effluent Limits under the CWA and/or State of New Hampshire Water Quality Standards

6.3.1 Outfall Location 001 (Cooling Tower Blowdown/ Low Volume Waste)

Chlorine

The Draft Permit limit for free available chlorine is based on the existing permit in accordance with the antibacksliding requirements found in 40 CFR §122.44. This limit was originally established based on New Source Performance Standards (NSPS) established in the Federal Guidelines for the Steam Electric Power Generating Point Source Category (40 CFR Part 423.15(j)(1)).

Section 423.15(j)(1) limits the maximum and average concentration of free available chlorine discharged in cooling tower blowdown as shown below. The quantity of pollutant (mass limit) is

determined by multiplying the flow of cooling tower blowdown by the concentration listed in the table. However, the existing permit, as well as the Draft Permit limits, are expressed as concentration limits pursuant to Section 423.15(m).

Pollutant	Maximum concentration (mg/l)	Average concentration (mg/l)
Free Available Chlorine	0.5	0.2

40 CFR Part 423.15(j)(2) prohibits the discharge of free available chlorine or total residual chlorine (TRC) from any unit for more that two hours in any one day, and; not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate that the units in a particular location cannot operate at or below this level of chlorination.

Newington Energy chlorinates the cooling tower system on most days by “shocking” the system. At 12:00 am, the discharge valve is closed and approximately 50 gallons of 13-15% sodium hypochlorite is added. The cooling system is allowed to recirculate for two to four hours until periodic testing determines that the free available chlorine concentration is below detection. If blowdown (i.e. discharging) must resume before there is no detectable amount of free available chlorine, Newington Energy must demonstrate that there is no detectable amount of total residual oxidants (TRO) within two hours.¹ TRO testing is required in the Draft Permit, as opposed to TRC, because the intake water contains bromides (i.e., saline water) (see 40 C.F.R. § 423.11(a)).

Regulations for “Steam Electric Power Generation Point Source Category” are found at 40 CFR Part 423. For steam electric power plants, the term "maximum concentration" means the maximum free available chlorine concentration over the short term (2 hours or less), as defined in the Effluent Limit Guidelines (ELGs) (see 40 CFR Section 423.15(j)(1)). The term “average concentration” means the average of analyses made over a single period of chlorine release which does not exceed two hours. These definitions differ from NPDES permit requirements at 40 CFR §122.2 and Part II of the Draft Permit, where the two terms: "maximum daily discharge" and "average daily discharge" concentrations are limited to 24-hour duration values.

For the Draft Permit, chlorine may be used as a biocide. No other biocide shall be used without written approval from the Regional Administrator and the Director.

pH

The initial pH limits in the existing permit, issued July 7, 2000, were based on NH Standards

¹ Although the plant operates 2 HRSG's, there is only one steam turbine generator with one corresponding non-contact surface condenser requiring cooling water. Therefore, based on the chlorination method and plant set-up, EPA considers this one unit for the determination of how many hours (i.e. two) in one day that Newington Energy may discharge effluent containing free available chlorine (within permitted limits).

which require that the pH be within the range of 6.5 - 8.0 standard units (s.u.). Part I.G of this 2000 permit allows the permittee to request a relaxation of the permitted pH range as long as the permittee can demonstrate that the discharge will not alter the naturally occurring receiving water pH.

On October 2, 2003, Newington Energy submitted the results of a pH demonstration study to NH DES. The demonstration project indicated that increasing the facility's permitted pH to a maximum of 9.0 s.u. will not significantly alter the naturally occurring receiving water pH. The NH DES responded to the pH limit adjustment study in a letter dated October 7, 2003, stating that it supports adjusting the NPDES permit limit for pH for Outfall 001 to the range 6.5 - 9.0 s.u.

By certified letter dated November 25, 2003, from Roger Janson of EPA to Ian Douglass of Con Ed Development, the pH limit for Outfall 001 of Newington Energy Facility's NPDES permit was changed to a range of 6.5 - 9.0 s.u.

EPA, in consultation with NH DES has determined that the demonstration study is still valid and therefore, the Draft Permit will retain the new pH limited range of 6.5 - 9.0 s.u. The revised range also falls within the allowable range under the New Source Performance Standards established in the Federal Guidelines for the Steam Electric Power Generating Point Source Category (i.e. 6.0 - 9.0 s.u.).

PCB's

40 CFR Part 423.15(b) prohibits the discharge of polychlorinated biphenyl (PCB) compounds.

Priority Pollutants

The Draft Permit limits for 126 priority pollutants², including total chromium and zinc, are based on the existing permit in accordance with the antibacksliding requirements found in 40 CFR §122.44 and on the New Source Performance Standards (NSPS) established in the Federal Guidelines for the Steam Electric Power Generating Point Source Category (40 CFR Part 423.15(j)(1) for cooling tower blowdown).

Pollutant	Maximum for any 1 day (mg/l)	Average of daily values for 30 consecutive days shall not exceed (mg/l)
The 126 Priority Pollutants (Appendix A) contained in chemicals added for cooling tower maintenance, except:	No detectable amount	No detectable amount

² The 126 priority pollutants (See 40 C.F.R. 423 Appendix A) are those potentially contained in chemicals added for cooling tower maintenance. No detectable amount is allowed in the discharge.

Chromium, total	0.2	0.2
Zinc, total	1.0	1.0

Section 423.15(j)(3) states that: “At the permitting authority's discretion, instead of the monitoring in 40 CFR 122.11(b), compliance with the limitations for the 126 priority pollutants in paragraph (j)(1) of this section may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR part 136.” This provision is retained in the Draft Permit.

The Draft Permit also requires that each chemical additive and low volume waste stream must be tested for priority pollutants at least once to determine the basis of any engineering calculations. Reliable information supplied by the manufacturer relative to the priority pollutants in a product may be substituted for actual tests for the chemical additives. Dilution for such engineering calculations must be based on lowest projected cooling tower blowdown flow. The chemical concentrations used in such engineering calculations shall be based on anticipated (or manufacturer's suggested) feed rates.

Salinity

The maximum daily discharge salinity limit of 60,000 parts per million (ppm) in the existing permit is based on Newington Energy's original permit application that was submitted before the facility was built. The limit was derived from modeling that was conducted using an expected, maximum, ambient salinity level of 30,000 ppm (30 ppt) and with the cooling towers operating at two cycles of concentration.³ Newington Energy has since determined that the ambient salinity levels can be as high as 33,000 ppm (33 ppt). Therefore, two cycles of concentration in the towers would result in a discharge of 66,000 ppm (66ppt); the new permit limit that Newington Energy is requesting.

The anti-backsliding provision of the CWA prohibits the renewal, reissuance or modification of a NPDES permit with less stringent limits than those in the previous permit. CWA § 402(o). However, a specific exemption allows water quality-based effluent limitations to be relaxed if the water body is in attainment for the relevant pollutant, if the water body will meet or exceed the applicable water quality standards under the new limit, and if the revision is consistent with the state's anti-degradation policy (CWA §§ 402(o)(1) and 303(d)(4)(B); *see also* EPA Interim Guidance on Implementation of Section 402(o) Anti-backsliding Rules for Water Quality-Based Permits (1989)).

³ The NHDES-Water Division granted a mixing zone in accordance with NH-Standards, Part Env-Ws 1707. The mixing zone extends 100 feet upstream (flood tide) and 100 feet downstream (ebb tide) of the diffuser and has a maximum width of 100 feet and a vertical distribution no more than 20 feet from the bottom. Based on modeling results, the current permit requires that the salinity at the edge of the mixing zone not exceed 1 part per thousand (ppt) above ambient.

Newington Energy's existing permit requires that the salinity concentration outside the mixing zone not be raised more than one part per thousand (ppt) above the ambient concentration. Newington Energy submitted projected salinity increases using the Cornell Mixing Zone Expert System Modeling Package (CORMIX).⁴ The results demonstrated that the requested salinity discharge concentration, even with a flow increase from 3.5 MGD to 4.0 MGD, will not increase the salinity at the edge of the mixing zone more than 1 ppt above ambient concentrations. For this reason, the New Hampshire Department of Environmental Services (NH DES) concluded that the new limit would be protective and did not object to the increased salinity limit with certain conditions.⁵ Likewise, the New Hampshire Fish and Game Department (NH F&G) does not object to the proposed increased limit. *See* letter dated December 26, 2006 from John Nelson, NH F&G to David Schafer, TRC.

EPA has allowed the increased salinity limit in the Draft Permit because the increase will not impair existing water quality as measured at the edge of the mixing zone, and the new limit does not violate the state's anti-degradation policy.

Flow

Newington Energy has also requested an increase in the maximum daily discharge flow from 3.5 MGD in the existing permit to 4.0 MGD in the Draft Permit. An increase in flow is needed to conduct a complete cooling tower blowdown. Flow in the Piscataqua River is dominated by tidal exchange. The tidal prism of the Piscataqua River Estuary has been estimated to total approximately 25,000 MGD (see Newington Power Facility NPDES Permit Application, July 1998, p 5-5). A discharge flow of 4.0 MGD represents only 0.016 % of the tidal prism volume. Similar to the salinity limit increase, the proposed increase in flow will not affect the designated uses of the river and does not violate the state's anti-degradation policy.

The Draft Permit will include a new minimum flow limit of 0.65 MGD, as requested by NH DES (See letter dated January 3, 2007, from Jeff Andrews, NH DES, to Sharon Zaya, US EPA). NH DES explains that the minimum flow limit is "necessary to avoid the situation whereby the negatively buoyant effluent plume is knocked down by the ambient current, which virtually eliminates discharge induced mixing and allows nominal dilution."

Temperature

Part Env-Ws 1703.13 of the NH-Standards states that, for Class B waters, temperature shall be in

⁴ CORMIX results submitted by TRC on behalf of Newington Energy on November 30, 2005, January 30, 2006, and December 15, 2006.

⁵ In the letter dated January 3, 2007, from Jeff Andrews, NH DES to Sharon Zaya, US EPA, NH DES requests that the Draft Permit include: a minimum flow limit; a mixing zone characterization study, and a condition requiring video-taping the diffuser.

accordance with RSA 485-A:8, II and VIII. RSA 485-A:8II states, in part, that “[a]ny stream temperature increase associated with the discharge of treated sewage, waste or cooling water, water diversions, or releases shall not be such as to appreciably interfere with the uses assigned to this class.” RSA 485-A:8VIII states that “[i]n prescribing minimum treatment provisions for thermal wastes discharged to interstate waters, the department shall adhere to the water quality requirements and recommendations of the New Hampshire [F]ish and [G]ame [D]epartment, the New England Interstate Water Pollution Control Commission, or the United States Environmental Protection Agency, whichever requirements and recommendations provide the most effective level of thermal pollution control.”

NH-Standards further provide that a mixing zone may be designated to allow exceedences of the water quality standards within a mixing zone as long as water quality standards are attained at the edge of the mixing zone and meet all minimum criteria specified in Env-Ws 1707.02.

The existing permit established a water quality-based thermal discharge limit based on the application of the NH-Standards’ mixing zone regulations. Specifically, the mixing zone extends 100 feet upstream (flood tide) and 100 feet downstream (ebb tide) of the diffuser and has a maximum width of 100 feet and a vertical distribution of no more than 20 feet from the bottom. Based on modeling results, the current permit requires that the temperature at the edge of the mixing zone not exceed 1°F above ambient river temperature. This is within recommendations of the NH DES, the NH F&G, and EPA’s Gold Book⁶ criteria for the protection of marine aquatic life from adverse thermal effects.

In establishing this mixing zone, EPA further determined that an end-of-pipe thermal limit of 90°F would not exceed New Hampshire’s narrative thermal water quality standard at the edge of the mixing zone. The 90°F limit was chosen based on Newington Energy’s original permit application that was submitted before the facility was built. Pre-construction design models estimated that the maximum effluent discharge temperature would be 89°F. Newington Energy explained to EPA and NH DES in a letter dated February 25, 2005, that “...with time the thermal transfer efficiency of the cooling tower decreases, making it harder for Newington Power to meet the 90°F discharge threshold. Therefore, Newington Power is requesting an increase in the maximum daily effluent discharge temperature limitation to 95°F to accommodate the inevitable higher discharge temperatures that will occur as the result of decreased cooling tower thermal transfer efficiency.”

Similar to the discussion regarding salinity above, the permit’s temperature limit is a water quality-based effluent limit and may be relaxed if the water body is in attainment for the relevant pollutant, if the water body will meet or exceed the applicable water quality standards under the new limit, and if the revision is consistent with the state’s anti-degradation policy. CWA §§ 402(o)(1) and 303(d)(4)(B).

CORMIX modeling results demonstrated that the requested temperature increase of 5°F at the

⁶ Quality Criteria for Water 1986 [The Gold Book] EPA Number: 440586001 Date of Publication: May, 1987.

end of pipe will still meet the original requirement that there must not be temperatures greater than 1°F above ambient at the edge of the mixing zone.⁷ Furthermore, NH DES and NH F&G do not object to the increase in the permits' end-of pipe temperature limit (see letter dated January 3, 2007, from Jeff Andrews, NH DES to Sharon Zaya, US EPA and letter dated December 26, 2006 from John Nelson, NH F&G to David Schafer, TRC).

EPA has allowed the increased temperature limit in the Draft Permit because the increase does not appreciably interfere with the assigned use of the Piscataqua River, the increase will not violate the original mixing zone requirements, the increase will not impair existing water quality as measured at the edge of the mixing zone, and the new limit does not violate the state's anti-degradation policy.

In addition, as requested by NH DES and NH F&G, the Draft Permit requires a mixing zone characterization study to verify the modeling results during reasonable worst case conditions in the summer when the facility may be operating at two cycles of concentration. In-stream sampling is required for temperature at the edges of the mixing zone. If the in-stream sampling results are significantly different than those predicted, this will be considered "new information" by EPA and the permit may be reopened to incorporate necessary temperature and/or salinity adjustments.

Also as requested by NH DES, the Draft Permit includes a requirement to inspect and video-tape the diffuser at least once every three years. EPA and NH DES are concerned that there is a potential for debris or boating activities to damage the diffuser ports. Damage may reduce the designed mixing properties of the diffuser, thereby reducing available dilution in the receiving stream.

Whole Effluent Toxicity

New Hampshire law states that, "all surface waters shall be free from toxic substances or chemical constituents in concentrations or combination that injure or are inimical to plants, animals, humans, or aquatic life;..." (N.H. RSA 485-A:8, VI and the N.H. Code of Administrative Rules, PART Env-WS 1703.21(a)(1)). The federal NPDES regulations at 40 CFR §122.44(d)(1)(v) require whole effluent toxicity limits in a permit when a discharge has a "reasonable potential" to cause or contribute to an excursion above the State's narrative criterion for toxicity.

EPA's Technical Support Document for Water Quality-based Toxics Control, EPA/505/2-90-001, March 1991, recommends using an "integrated strategy" containing both pollutant (chemical) specific approaches and whole effluent (biological) toxicity approaches to control toxic pollutants in effluent discharges from entering the nation's waterways. EPA-New England adopted this "integrated strategy" on July 1, 1991, for use in permit development and issuance. These approaches are designed to protect aquatic life and human health. Pollutant specific

⁷ CORMIX results submitted by TRC on behalf of Newington Energy on November 30, 2005, and December 15, 2006.

approaches such as those in the “Gold Book”⁸ and State regulations address individual chemicals, whereas, whole effluent toxicity (WET) approaches evaluate interactions between pollutants, thus rendering an "overall" or "aggregate" toxicity assessment of the effluent. Furthermore, WET measures the "additivity" and/or "antagonistic" effects of individual chemical pollutants which pollutant specific approaches do not, thus the need for both approaches. In addition, the presence of an unknown toxic pollutant can be discovered and addressed through this process.

The facility uses a variety of water treatment chemicals in the cooling water system. It is not practical for EPA to identify and limit every chemical the permittee may use throughout the life of the permit. In addition, limiting individual chemicals does not take into account any possible synergistic effects when these chemicals are combined. Therefore, the Draft Permit requires the facility to successfully pass an acute toxicity test within 7 days if any changes in the water treatment chemicals and/or their concentrations occurs (See Section I.A.10 of the Draft Permit).

Results from these tests will provide the EPA, the State and the permittee with an estimate of the overall toxic content of its discharge. If toxicity violations are shown, monitoring frequency and testing requirements may be increased in addition to enforcement actions. The permit may also be modified, or alternatively, revoked and reissued to incorporate additional toxicity testing requirements or chemical specific limits.

The WET sampling frequency in this Draft Permit has been retained at four (4) tests per year using two (2) species: Mysid Shrimp (*Mysidopsis bahia*) and Inland Silverside (*Menidia beryllina*). Based upon available dilution and in accordance with EPA-New England's Toxicity Policy, an acute limit of LC50 using a sample of 50 percent effluent is added to the Draft Permit. LC50 is defined as the concentration of toxicant, or in this case, as percentage of effluent that would be lethal to 50 % of the test organisms during a 48 hour testing period. Therefore, a 50 % limit means that a sample of 50 % effluent shall cause no greater than a 50 % mortality rate in that effluent sample. The Acute- No Observed Adverse-Effect Level (A-NOAEL) monitoring-only requirement is included in the Draft Permit due to the potential presences of water treatment chemicals in the discharge.

This Draft Permit requires reporting of selected parameters determined from the chemical analysis of the WET test's 100 % effluent sample. Specifically, total residual oxidants, ammonia, and total aluminum, cadmium, copper, chromium, lead, nickel and zinc are to be reported on the appropriate Discharge Monitoring Report (DMR) for entry into EPA's ICIS data base. EPA-New England does not consider these reporting requirements an unnecessary burden as reporting these constituents is required with the submission of each toxicity testing report (see Draft Permit, Attachment A, page A-6).

6.3.2 Outfall Location 003 (Intake Screen Spray Wash)

The existing limits for pH and temperature at this location were based on the capability of the facility to perform heated backwashing as a way to control biofouling and/or ice build up in the

⁸ Quality Criteria for Water 1986, EPA Number: 440586001, May, 1987.

intake structure. As previously indicated, this design feature was not built into the facility. In addition, the spray wash water is pumped directly from the river, in the intake well, and there is no possible mechanism to change (increase or decrease) either the pH or temperature during the spray wash operation compared to ambient conditions. As a result, these requirements have been removed from the Draft Permit. Similar to the discussion regarding the change in the flow limit for Outfall 001, this permit change does not violate Section 402(o) of the CWA regarding anti-backsliding since the absence of these requirements in the Draft Permit will not affect the designated uses of the river and does not violate the state's anti-degradation policy.

6.3.3 Internal Outfall Locations 004 and 005 (Low Volume Waste)

Total Suspended Solids and Oil & Grease

The Draft Permit limits for Total Suspended Solids (TSS) and Oil and Grease (O&G) are based on the existing permit in accordance with the antibacksliding requirements found in 40 CFR §122.44. These limits were originally established based on NSPS established in the Federal Guidelines for the Steam Electric Power Generating Point Source Category (40 CFR Part 423.15(c) for low volume waste source(s)).

Section 423.15(c) limits the maximum and average concentration of TSS and O&G discharged in low volume waste source(s) as shown below. The quantity of pollutant (mass limit) is determined by multiplying the flow of low volume waste source by the concentration listed in the table. However, the existing permit, as well as the Draft Permit limits, are expressed as concentration limits pursuant to Section 423.15(m). The permit reflects these limits prior to mixing with cooling water in the towers.

Pollutant	Maximum for any 1 day (mg/l)	Average of daily values for 30 consecutive days shall not exceed (mg/l)
TSS	100.0	30.0
O&G	20.0	15.0

6.4 Cooling Water Intake Structure Requirements under CWA § 316(b)

With any NPDES permit issuance or reissuance, EPA is required to evaluate or re-evaluate compliance with applicable standards, including those stated in CWA Section 316(b) regarding cooling water intake structures (CWIS). CWA §316(b) applies if the permit applicant seeks to withdraw cooling water from waters of the United States. To satisfy §316(b) the permit applicant must demonstrate to the satisfaction of the EPA (or, if appropriate, the State) that the location, design, construction, and capacity of the facility's CWIS(s) reflect the best technology available (BTA) for minimizing adverse environmental impacts. Such impacts include death or injury to aquatic organisms by impingement (being pinned against screens or other parts of a CWIS) or entrainment (being drawn into cooling water systems and subjected to thermal, physical or chemical stresses).

EPA has promulgated final §316(b) regulations providing specific technology standard requirements for the following:

1. New power plants and other types of new facilities with CWISs (so-called “Phase I” facilities). 66 Fed. Reg. 65255 (Dec. 18, 2001) (effective date of the regulations is January 17, 2002);
2. Existing power plants with flows of 50 million gallons per day or more (“Phase II” facilities)⁹. 69 Fed. Reg. 41576 (July 9, 2004) (effective date is September 7, 2004); and
3. New offshore oil and gas extraction facilities that have a design intake flow threshold of greater than 2 million gallons per day (“Phase III” facilities). 71 Fed. Reg. 35006 (June 16, 2006) (effective date is July 17, 2006).

These regulations do not, however, apply to existing *small* power plants with a maximum design intake flow less than 50 MGD such as Newington Energy (or to existing manufacturing facilities). Newington’s design intake capacity is 14.4 MGD. In the absence of applicable compliance standards, Section 316(b) permit requirements for smaller, existing facilities, such as Newington Energy, continue to be established on a case-by-case, best professional judgment (BPJ) basis. EPA has determined that the present location, design, construction, and capacity of Newington Energy’s CWIS(s) reflect the BTA for minimizing adverse environmental impacts for the reasons presented below:

“Location”

Newington Energy’s CWIS is located in the Piscataqua River, between 200 and 255 feet away from the shoreline (depending on the tide). The constant influence of the incoming and outgoing tides at this location cause the velocity of the river in the vicinity of the CWIS to drop below 0.5 knots (0.8 feet per second (ft/sec)) for only short periods at slack tides. Maximum expected river velocity routinely builds to or exceeds 2.0 knots (3.4 ft/sec) twice during each tidal cycle (see Newington Supporting Document, November 30, 2005, Figures 8 through 17). For the great majority of the time, the upstream and downstream forces exerted by the tidal river velocity are much greater than the through-screen velocity of the CWIS, calculated to be at or below 0.5 ft/sec. Fish swimming in the vicinity of the CWIS must contend with these tidally induced river velocities that move across the intake screens. In this high energy estuarine environment, adult and juvenile fish are far less influenced by the relatively small through-screen velocity of the CWIS. In addition, the CWIS is located away from the shoreline, where tidal river velocities are less diminished by shoreline structure. These two features of the location of the Newington Energy CWIS minimize the adverse environmental impacts of fish and invertebrate impingement.

The relatively greater velocity of the river also acts to sweep free floating eggs and larvae of fish and invertebrates past the CWIS for the large majority of any 24 hour cycle. This provides less

⁹ On January 25, 2007, the United States Court of Appeals for the Second Circuit remanded several aspects of the Phase II Rule to EPA. As a result of the remand, EPA suspended the Rule on March 20, 2007. While the ultimate result of the remand is yet to be determined, the 50 MGD total design intake flow threshold is likely to be unaffected.

opportunity for entrainment of these life stages by the intake structure. The location of the CWIS in this high energy tidal river minimizes the adverse environmental impacts of fish and invertebrate entrainment.

“Design and Construction”

The CWIS is equipped with two intake bays containing a 5,000 gallons per minute (gpm) variable speed pump in each bay, resulting in a total design capacity of 14.4 MGD. Although the total design flow is 14.4 MGD, the total actual maximum flow is reduced to 10.8 MGD due to pressure changes and friction. Generally, only one pump is used at a time and occasionally two pumps are used. As previously mentioned, the through-screen velocity has been calculated to be at or below 0.5 feet per second (ft/s). Low intake velocity (<0.5 ft/s) has been shown to result in less impingement and entrainment.¹⁰

Inside the intake channels is a cross over sluice gate. This gate is normally kept open, which results in lower through screen/approach velocities because of the increase screen area available.

The Draft Permit requires that, as part of BTA, the permittee keep the cross-over sluice gate open to the maximum extent practicable.

The intake bay openings are located 5 to 6 feet off the bottom of the river, thereby minimizing the likelihood that crabs, lobsters, flounder or any other primarily benthic organisms will be drawn into the structure. In addition, the intake openings are also 4.5 feet below the mean low water level, reducing impingement of juvenile and adult fish that reside in the upper water column.

Each intake bay is equipped with vertically rotating, 1/4" x 1/2" mesh, modified Ristroph screens. Low pressure (15 psi) spray wash is used to gently remove any trapped organisms from the intake screens. These organisms are returned directly into the river water (even at low tide level) via a covered sluiceway. The sluiceway is covered to prevent predation by seagulls.

The low through screen velocity, the position of the CWIS opening off the bottom, the Ristroph screens and the low pressure spray wash are all components of BTA to minimize the adverse environmental impacts of fish and invertebrate impingement.

“Capacity”

Newington uses a 10-cell mechanical draft cooling tower to eliminate waste condenser heat through the process of water evaporation. The facility withdraws water from the Piscataqua River for cooling tower make-up at a maximum design intake flow of 14.4 MGD. This

¹⁰ EPA considers velocity to be an important factor that can be controlled to minimize adverse environmental impacts at CWIS's. See 66 FR 65274, December 18, 2001. For example, in most cases a velocity threshold of 0.5 ft/s has been identified as protective of most species of fish. This determination is discussed in 66 FR 65274, December 18, 2001.

recirculating “closed-cycle” system significantly reduces the amount of river water withdrawn compared to the more traditional “once-through” cooling water systems in operation at most coastal locations; a reduction of nearly 95%.

EPA recognizes that the volume of water withdrawn by a CWIS is approximately related to the potential for impingement and entrainment, all other factors being equal. The flow volume or capacity of a CWIS is a major factor affecting the entrainment of organisms. The closed-cycle system used at Newington Energy is one of the components of BTA to minimize the adverse environmental impacts of fish and invertebrate impingement and entrainment.

Impingement monitoring conducted at the facility from October 2002 through January 2004 and entrainment monitoring conducted from November 2000 through December 2003 supports the position that the location, design, construction and capacity of the CWIS has reduced impingement mortality and entrainment at Newington Energy. The results of impingement and entrainment monitoring are discussed in the Monitoring Results Section below.

6.4.1 Biological Monitoring Results

Impingement monitoring was required at Newington Energy as part of the existing permit conditions. Impingement sampling was conducted from October 2002 through January 2004, following the regime set out in the Post-Operational Biological Monitoring Program (TRC, July 2002). In all, thirteen species with an extrapolated annual total of 324 fish were represented in the collections (TRC Impingement Report, March 2004). Grubby (*Myoxocephalus aneaeus*) made up 37 percent of this extrapolated total, Atlantic tomcod (*Microgadus tomcod*) was 25 percent of the total, cunner (*Tautoglabrus adspersus*) was 10 percent, and threespine stickleback (*Gasterosteus aculeatus*) accounted for 6 percent of the total. These four species made up 78 percent of the extrapolated yearly impingement total (TRC Impingement Report, March 2004).

The observed annual impingement total of 324 fish is approximately one quarter of the number estimated in the previous NPDES permit application, before the monitoring program began. The impingement rate of 0.110 fish per million gallons of water withdrawn was within the range of 0.038 to 28.950 fish per million gallons of water withdrawn, using impingement data from ten other New England electric generating stations (TRC Impingement Report, Table 6, March 2004). However, because the volume of water withdrawn by the closed cycle cooling system of Newington Energy is much less than at other generating stations, Newington Energy had by far the lowest mean impingement per day (less than 1 fish) and per year (300 fish) when compared with the ten other New England electric generating stations. Impingement at those stations ranged from 9 to 10,527 mean impingement of fish per day and 3,285 to 3,842,206 mean impingement of fish per year (TRC Impingement Report, March 2004).

Ichthyoplankton studies were conducted to estimate entrainment at Newington Energy as part of the existing permit conditions. Sampling for fish eggs and larvae was one phase of the pre- and post-operational biological monitoring program. Pre-operational sampling was conducted twice

per month from November 2000 through September 2002 and post-operational sampling was completed twice per month from October 2002 through December 2003, following the methods documented in the data summary and analysis report (Ichthyoplankton Studies for the Newington Power Facility 2001 - 2003, MRI/TRC, September 2004).

The following summary information was obtained directly from the document *Ichthyoplankton Studies for the Newington Power Facility 2001 - 2003*, pages 6-1 to 6-2, prepared by Marine Research Incorporated and TRC Environmental Corporation in September of 2004. More detailed ichthyoplankton information is included in that report.

A wide variety of species (annual range = 40-42 species) were found in 2000-2003 ichthyoplankton samples from the Piscataqua River and Portsmouth Harbor, representing common species found in this biogeographical area. The species collected were relatively consistent from year to year, with the majority of fish species found in all three years of study. Tautog/cunner (the labrids) represented the majority of fish eggs collected over the 2001 - 2003 period, making up 77 - 96 percent, of all eggs found depending upon the year. Other common egg species, in order of numerical importance, included the hakes, Atlantic mackerel, early stage rockling and hake eggs, silver hake, and fourbeard rockling. Cunner made up the majority of the fish larvae collected in the 2001 - 2003 River and Harbor samples. Other common larvae include Atlantic herring, fourbeard rockling, sand lance, rock gunnel, silver hake, grubby, shorthorn sculpin, radiated shanny, hake, Atlantic mackerel, and the seasnail. (MRI/TRC, September 2004)

Potential effects of the Newington Power Facility on selected species of fish eggs and larvae found in the Piscataqua River were examined in detail. Those species included Atlantic herring, Atlantic cod, silver hake, Atlantic tomcod, cunner, tautog, sand lance, Atlantic mackerel, and winter flounder. These species were either among the most abundant collected or important to recreational and commercial interests. Since the cooling system discharge for the Newington Power Facility was not accessible for direct sampling arithmetic mean[,] egg and larval densities obtained at the Intake River station on each sampling date were multiplied by 7 mgd (= 11.041; 100 m³ units per day), the permitted flow of the Facility, and integrated over time to obtain seasonal estimates of the potential number entrained. Estimated numbers of eggs and larvae entrained were then examined using the equivalent adult (EA) procedure. (MRI/TRC, September 2004)

In addition to the equivalent adult approach[,] conditional mortality rates were calculated by relating potential numbers entrained to an estimate of the number of eggs and larvae present in the surrounding area that contribute to the cooling water. The source pool was conservatively defined as 25 percent of the volume of 'new' coastal water extending out two miles from shore entering the Piscataqua River each day (60,833 - 1000 m³ units per day). Net coastal drift was assumed to be 5 cm per second based on USGS coastal measurement and modeling data. Although the Facility was not in operation in 2001 and for most of 2002, egg and larval densities obtained during those years were used to provide two additional hypothetical estimates of potential Facility effects. Combined with the year of operational data[,] the early results, while hypothetical, provide a time series

suggesting that 2003 was typical of what can be expected in future years. (MRI/TRC, September 2004)

For each species examined[,] annual equivalent adult values were low. They amounted to less than ten pounds each for cod, silver hake, tautog, and mackerel. For tomcod, sand lance, and winter flounder annual values were less than 50 pounds each. Values for Atlantic herring ranged from 42 to 521 pounds depending upon the year, amounting to a small fraction of the estimated local stock. Largest numbers of fish were obtained for cunner consistent with the abundance of their eggs and larvae in the Piscataqua River. Annual totals ranged from 2,700 to 3,100 fish weighing about 350 pounds. Cunner are very abundant and the facility losses were estimated to amount to less than 0.1 percent of the local stock. Conditional mortality rates were also very low for all species examined, generally well under 1 percent. (MRI/TRC, September 2004)

Information from the study indicated that upstream transport of eggs and larvae from Portsmouth Harbor and offshore waters occurs in the system and that the majority of spawning activity likely takes place some distance from the Facility (MRI/TRC, September 2004).

Entrainment estimates, averaged over the three years of data collection for species that occurred with greater relative abundance included Atlantic herring (an average of 908,148 larvae per year; no eggs entrained), Atlantic cod (an average of 59,173 eggs and 44,251 larvae per year), silver hake (whiting) (an average of 78,431 eggs and 212,495 larvae per year), sand lance (an average of 1,096,340 larvae per year; no eggs entrained), Atlantic mackerel (an average of 210,225 eggs and 49,577 larvae per year), winter flounder (an average of 17,968 eggs and 79,580 larvae per year), and cunner (an average of 13,186,999 eggs and 7,134,798 larvae per year; calculated from MRI/TRC, September 2004, Table 11). Projections made by the permittee before the Facility became operational estimated the percent of fish eggs and larvae entrained to be less than 1 percent of the local source pool. When compared with the estimated number of fish eggs and larvae in the local source pool for each species, these numbers were calculated to be between 0.008 percent and 0.1 percent of the local source pool of ichthyoplankton. These estimates, based on site-specific data collected over three years, are much lower than projected before the biological monitoring program was conducted (MRI/TRC, September 2004).

The number of eggs and larvae described above translated into the following adult equivalent estimates, averaged for the three years of data collection: Atlantic herring (an average of 893 age 3 fish per year), Atlantic cod (an average of 1 age 2 fish per year), silver hake (whiting) (an average of 7 age 3 fish per year), sand lance (an average of 2,050 age 2 fish per year), Atlantic mackerel (an average of 1 age 3 fish per year), winter flounder (an average of 29 age 3 fish per year) and cunner (an average of 2,866 age 1 fish per year; calculated from MRI/TRC, September 2004, Table 11). These entrainment numbers are consistent with a closed-cycle cooling system that uses much less water and has a far reduced potential for entrainment when compared with an electric generating facility of a similar generating capacity that uses once-through cooling.

In summary, EPA has reviewed the data presented in the MRI/TRC report. EPA finds that the approach taken in the report is acceptable and EPA concurs with the results and conclusions

which are referenced and summarized in this section.

6.4.2 BTA Determination

In conclusion, EPA has determined, based on BPJ, that the present location, design, construction and capacity of Newington Energy's cooling water intake structure reflects the BTA for minimizing adverse environmental impacts. Data collected as part of the Biological Monitoring Program for Newington Energy supports this conclusion. Part I.A.8 of the Draft Permit includes the following requirements as components of BTA:

- a. No change in the location, design or capacity of the present structure can be made without prior approval of the Regional Administrator and the Director.
- b. Heated backwash of the intake for biofouling, ice control or any other purpose is prohibited without prior approval of the Regional Administrator and the Director.
- c. The intake bays' cross-over sluice gate shall remain open to the maximum extent practicable.

6.5 Stormwater Requirements

Storm water discharges to the Piscataqua River are covered by the facility's Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activities #NHR05A704. The Draft Permit requires that the permittee maintain storm water coverage under this permit.

7. Essential Fish Habitat

Under the 1996 Amendments (PL 104-297) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq. (1998)), EPA is required to consult with the National Marine Fisheries Service (NOAA Fisheries) if EPA's actions, or proposed actions that EPA funds, permits, or undertakes, "may adversely impact any essential fish habitat." 16 U.S.C. § 1855(b). The Amendments broadly define essential fish habitat (EFH) as, "... those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." 16 U.S.C. § 1802(10). Adverse effect means any impact which reduces the quality and/or quantity of EFH. 50 C.F.R. § 600.910(a). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. Id.

EFH is only designated for species for which federal Fishery Management Plans exist (16 U.S.C. § 1855(b)(1)(A)). EFH designations were approved for New England by the U.S. Department of Commerce on March 3, 1999.

The Piscataqua River is high value habitat for a variety of marine and estuarine species, and serves as the only conduit between the Gulf of Maine and Great Bay Estuary. While some fish species permanently reside in the river, most use it to either access spawning or nursery habitats

in the Great Bay Estuary and associated rivers, or to migrate from these areas to marine habitats in the Gulf of Maine and beyond. Still others are seasonally present, preying on the concentrated but temporal influx of migrating forage species. Table 2 lists the EFH species located in the vicinity of Newington Energy (NMFS Habitat Division).

As the federal agency charged with authorizing the discharge from this facility, EPA consulted with NOAA Fisheries during the initial NPDES permit action related to this facility (see March 8, 2000 letter to NOAA Fisheries and their March 17, 2000 response in permit file) under section 305 (b)(2) of the Magnuson-Stevens Act for EFH. As part of the renewal of the NPDES permit for this facility, EPA will submit the Draft Permit and the Fact Sheet to NOAA Fisheries Habitat Division to satisfy EPA's notification responsibility regarding EFH.

Table 2: EFH Species Located in the Vicinity of Newington Energy

Species	Eggs	Larvae	Juveniles	Adults	Spawning Adults
Atlantic salmon (<i>Salmo salar</i>)			F,M		
Atlantic cod (<i>Gadus morhua</i>)	S	S			
haddock (<i>Melanogrammus aeglefinus</i>)	S	S			
pollock (<i>Pollachius virens</i>)	S	S	S		
whiting (<i>Merluccius bilinearis</i>)					
offshore hake (<i>Merluccius albidus</i>)					
red hake (<i>Urophycis chuss</i>)			S	S	
white hake (<i>Urophycis tenuis</i>)	S		S	S	
redfish (<i>Sebastes fasciatus</i>)	n/a				
witch flounder (<i>Glyptocephalus cynoglossus</i>)					
winter flounder (<i>Pleuronectes americanus</i>)	M,S	M,S	M,S	M,S	M,S
yellowtail flounder (<i>Pleuronectes ferruginea</i>)	S	S			
windowpane flounder (<i>Scopthalmus aquosus</i>)	S	S	S	S	S
American plaice (<i>Hippoglossoides platessoides</i>)					
ocean pout (<i>Macrozoarces americanus</i>)					
Atlantic halibut (<i>Hippoglossus hippoglossus</i>)	S	S	S	S	S

Atlantic sea scallop (<i>Placopecten magellanicus</i>)			S	S	
Atlantic sea herring (<i>Clupea harengus</i>)		M,S	M,S		
monkfish (<i>Lophius americanus</i>)					
bluefish (<i>Pomatomus saltatrix</i>)			M,S	M,S	
long finned squid (<i>Loligo pealei</i>)	n/a	n/a			
short finned squid (<i>Illex illecebrosus</i>)	n/a	n/a			
Atlantic butterfish (<i>Peprilus triacanthus</i>)					
Atlantic mackerel (<i>Scomber scombrus</i>)	M,S	M,S	S		
summer flounder (<i>Paralichthys dentatus</i>)					
scup (<i>Stenotomus chrysops</i>)					
black sea bass (<i>Centropristus striata</i>)					
spiny dogfish (<i>Squalus acanthias</i>)	n/a	n/a			
tilefish (<i>Lopholatilus chamaeleonticeps</i>)					

The Newington Energy Facility, like all facilities that utilize a natural waterbody for cooling purposes, can impact aquatic resources in three major ways: (A) by the entrainment of small organisms into and through the cooling water system; (B) by the impingement of larger organisms on the intake screens; and (C) by creating adverse conditions in the receiving waters from the discharge of heated effluent. The following discusses these three possibilities.

Entrainment

The potential to impact aquatic organisms by entrainment largely depends on the presence and abundance of organisms that are vulnerable to entrainment, and the flow required for cooling. Other important considerations include the location and design of the intake structure. According to section 316(b) of the Clean Water Act, any point source that uses a cooling water intake structure must ensure that its location, design, construction, and capacity reflects the best technology available (BTA) for minimizing adverse environmental impact.

The EFH resources (including forage species) most vulnerable to entrainment in the vicinity of this proposed facility are species that have positively buoyant eggs, and/or pelagic larvae.

Ichthyoplankton studies were conducted to estimate entrainment at Newington Energy as part of the existing permit conditions. Sampling for fish eggs and larvae was one phase of the pre- and

post-operational biological monitoring program. Pre-operational sampling was conducted twice per month from November 2000 through September 2002 and post-operational sampling was completed twice per month from October 2002 through December 2003, following the methods documented in the data summary and analysis report (Ichthyoplankton Studies for the Newington Power Facility 2001 - 2003, MRI/TRC, September 2004).

Overall entrainment estimates are discussed in Section 6.4.1 of the Fact Sheet. The Fact Sheet supporting the existing NPDES permit for Newington Energy predicted losses from entrainment to be low (<1%) relative to the locally available source pool. Calculated entrainment losses, based on three years of ichthyoplankton collection in the vicinity of Newington Energy, were calculated to be between 0.008% and 0.1% of the locally available source pool (MRI/TRC, September 2004). These estimates, based on site-specific data collected over three years, are much lower than projected before the biological monitoring program was conducted (MRI/TRC, September 2004). The entrainment numbers are consistent with a closed-cycle cooling system that uses much less water and has a far reduced potential for entrainment when compared with an electric generating facility of a similar generating capacity that uses once-through cooling.

The annual loss associated with entrainment of eggs and larvae, when converted to equivalent adults (EA) for EFH and major forage species, was generally within the range predicted in the supporting information of the current NPDES permit. Based on the three years of entrainment data collected from 2001 through 2003, some differences between the predicted annual losses and the calculated losses were seen. Some of these exceptions included American plaice (60 EAs predicted; eggs and larvae not collected in sufficient numbers to calculate an EA), sand lance (22,500 EAs predicted; 2,050 calculated), winter flounder (55 EAs predicted; 29 calculated) yellowtail flounder (25 EAs predicted; eggs and larvae not collected in sufficient numbers to calculate an EA). While these exceptions indicated that the projections were greater than the actual EAs that were calculated, in the case of Atlantic herring the EA predicted was less than the EA calculated (25 EAs predicted; 893 calculated). This still represents less than 0.05% of the local source pool and less than 0.00026% of the area stock of Atlantic herring, based on information submitted by the permittee (MRI/TRC, September 2004).

This facility incorporates BTA into the design and location of its intake structure, as well as the cooling water requirements of the plant. Cooling water requirements associated with wet cooling technology average approximately 10.8 mgd under normal operating conditions, which is significantly less than required for a once-through system producing the same electrical output. The permittee referred to entrainment studies on once-through cooling systems that show some survival of plankton, unlike the total loss expected from a closed-cycle cooling tower operation, i.e., consumptive vs. non-consumptive. However, even assuming a 50% survival of organisms entrained at the older existing facilities, the permittee estimated that the impact of the Newington Energy Facility, assuming 100% loss, is still considered to be approximately 40 times less.

Impingement

Organisms that have grown to a size too large to pass through intake screens are still vulnerable to being impinged on these screens. Juvenile lifestages are particularly vulnerable to

impingement, but adults of certain species are also at risk. As with entrainment, the intake location, design and cooling water flow requirements are major factors in assessing impingement potential.

Fish species that are especially vulnerable to impingement tend to have one or more of the following characteristics:

- pass intake structure in large, dense schools as juveniles or adults;
- are actively pursued as major forage species;
- are attracted to the intake structure as a source of forage or refuge;
- are slow moving or are otherwise unable to escape intake current;
- are structurally delicate, and likely to die if impinged.

Impingement monitoring was required at Newington Energy as part of the existing permit conditions. Impingement sampling was conducted from October 2002 through January 2004, following the regime set out in the Post-Operational Biological Monitoring Program (TRC, July 2002). In all, thirteen species with an extrapolated annual total of 324 fish were represented in the collections (TRC Impingement Report, March 2004). The observed annual impingement total of 324 fish is approximately one quarter of the number estimated in the previous NPDES permit application, before the monitoring program began. Of the EFH species and their forage predicted, the annual impingement rate for hake was predicted to be approximately 250 fish, while an impingement rate of 6 fish was observed, based on impingement sampling. Winter flounder was projected to be impinged at an annual rate of 20 fish, while a rate of 6 fish was observed. Regarding forage species for EFH, Atlantic silverside was projected to be impinged at an annual rate of 30 fish, while a rate of 4 fish was observed. Atlantic menhaden was projected to be impinged at an annual rate of 10 fish, while a rate of 12 fish was observed. None of the other EFH species or forage species for EFH were collected as part of the impingement sampling program at Newington Energy (TRC Impingement Report, March 2004). This low impingement rate supports EPA's conclusion that the impacts associated with this facility to EFH species, their habitats and forage, have been minimized to the extent that no significant impacts are expected.

The intake structure was sited to avoid any specific habitats of high value such as eelgrass beds or mudflats, and to take advantage of the river's strong tidal currents, which likely minimizes the number of fish congregating near the intake.

The cooling water intake structure at Newington Energy Facility was designed to minimize impingement of all species, and maximize survival of organisms that have been impinged. The intake bay openings are 5 feet x 6 feet in size and located 4.5 feet below the mean low water level and 5 to 6 feet off the bottom of the river. This design avoids concentrations of benthic organisms, as well as surface dwellers such as larval lobster. The intakes have been designed such that approach velocities directly in front of the intakes are no greater than 0.5 feet/second at any tidal stage. The use of a modified Ristroph screen design, including a high and low pressure screen wash system and fish return, maximize the probability of survival for impinged organisms. Also, the intake and fish return are located so as to reduce the chance of reimpingement.

As with entrainment impacts, the wet cooling design of this facility has minimized water requirements, which in combination with low intake velocities, has been demonstrated to reduce impingement.

Discharge of Effluent (Heat and Salinity)

The discharge of heated effluent may kill or impair organisms outright, or create intolerable conditions in otherwise high value habitats, and interfere with spawning. Thermal impacts associated with the discharge are related primarily to the dilution capacity of the receiving water, the rate of discharge, and the ΔT of the effluent compared to ambient water temperatures. Another important consideration is the presence of temperature-sensitive organisms and vegetated habitats.

This facility currently discharges approximately 3.5 mgd of heated effluent. At the request of the permittee, the maximum discharge in the Draft Permit is proposed to be increased to 4.0 mgd. The proposed increase in flow will not affect the designated uses of the river and does not violate the state's anti-degradation policy. A full discussion of this modification is included in Section 6.3.1, under the Flow subheading.

The Draft NPDES permit will also propose a maximum discharge temperature of 95° F. While this discharge temperature is 5.0° F higher than the maximum discharge temperature allowed in the current permit, the temperature limit at the edge of the mixing zone has not been adjusted. A complete discussion of the maximum discharge temperature is included in Section 6.3.1, under the Temperature subheading of the Fact Sheet. EPA has allowed the increased temperature limit in the Draft Permit because the increase does not appreciably interfere with the assigned use of the Piscataqua River, the increase will not violate the original mixing zone requirements, the increase will not impair existing water quality as measured at the edge of the mixing zone, and the new limit does not violate the state's anti-degradation policy.

Since the river water used to cool the condenser will undergo approximately 2 cycles of concentration in the evaporative cooling towers, the discharge is expected to be negatively buoyant due to increased salinity (approximately doubled).

The discharge outfall takes advantage of the near-constant tidal current within the Piscataqua River in order to achieve rapid dilution. The design consists of a multiport diffuser with 6 equally spaced 3-inch ports, each angled towards the centerline of the river. The diffuser is oriented perpendicular to the flow of the river. Even under the extreme case of a 35° F ΔT between river intake water temperature and the discharge temperature, CORMIX models predict a 5° F ΔT (above ambient river temperature) will be attained within approximately 10 feet of the discharge point, under all tidal scenarios. A ΔT no greater than 1°F above ambient at the edge of the designated mixing zone is a requirement of the permit.

The maximum daily discharge salinity limit of 60,000 parts per million (ppm) in the existing permit is proposed to be changed to a discharge of 66,000 ppm (66ppt) in the Draft Permit, at the

permittee's request Newington Energy's existing permit requirement that the salinity concentration outside the mixing zone not be raised more than one part per thousand (ppt) above the ambient concentration has not been altered and will be met under the proposed salinity discharge limit. The proposed increase in salinity will not affect the designated uses of the river and does not violate the state's anti-degradation policy. A full discussion of this modification is included in Section 6.3.1, under the Salinity subheading.

The combined salinity and thermal plumes will likely interact with the substrate beyond the limits of the mixing zone, but are predicted to be within 1 ppt salinity and 1°F of ambient at the point of interaction.

Early lifestages that are adrift in the water column and cannot avoid the discharge may become entrained in the plume, however, lethal thermal and salinity conditions are expected to be restricted to the immediate area around the discharge point. Non-lethal effects may render some organisms less fit for survival, but since organisms will be exposed for such a brief period of time (approximately 1 second), adverse effects will likely be limited to a temporary increase in vulnerability to predation. The permittee estimated that impacts to fish resources related to discharge plume entrainment would be approximately 1/20 of 1 percent of the local populations, based on volumetric estimates of exposed larvae.

Post operational monitoring was conducted as established in the thermal/salinity mixing zone characterization studies in the permit to confirm the predicted limits of the thermal and salinity plumes. Additionally, pre-operational dive surveys were conducted to document the baseline benthic community in proximity to the diffuser. After the facility was fully operational, a follow-up dive survey was conducted to examine changes in the benthic community structure. In general, surveys conducted between the benthic control site and the site at the Facility discharge diffuser after Newington Energy began operation revealed much greater similarity between the control and diffuser sites when compared with pre-operational surveys at the same two locations. Although the post-operational number of benthic individuals was lower at the diffuser site, the Shannon¹¹ diversity indices were nearly equal. An overall increasing trend in species diversity at both survey locations is one indicator that these sites do not seem to be showing signs of stress since the Facility began operation. The study results are fully discussed in the *Newington Power Facility Pre- and Post-Operational Infauna Survey Report* (MRI/TRC, April 2004).

EPA's Opinion of all Potential Impacts to EFH Species

EPA has concluded that the Newington Energy Facility operating conditions and the limits and conditions contained in this Draft Permit minimize adverse effects to the Piscataqua River EFH for the following reasons:

¹¹ The Shannon diversity index is a index that is commonly used to characterize species diversity in a community. Shannon's index accounts for both abundance and evenness of the species present. The proportion of species relative to the total number of species is calculated, and then multiplied by the natural logarithm of this proportion. The resulting product is summed across species, and multiplied by -1.

- 1- the closed-cycle recirculating system significantly reduces the amount of river water withdrawn compared to the more traditional “once-through” cooling water systems in operation at most coastal locations; a reduction of nearly 95%;
- 2- during discharge, the effluent is rapidly diluted so as to raise the ambient temperature by no more than 1 degree Fahrenheit at the edge of the mixing zone;
- 3- quarterly WET testing is required to evaluate the effluent’s ability to meet permitted limits and/or in stream NH-Standards;
- 4- the location, design, construction, and capacity of the facility’s cooling water intake structure (CWIS) reflect the Best Technology Available (BTA) for minimizing adverse environmental impacts; and
- 5- environmental monitoring has provided contemporary, site-specific data, entrainment and impingement rates, evaluation of the local benthic community, and plume characteristics and movement. Data collected support the conclusion that impacts associated with the facility to EFH species, their habitats and forage, have been minimized.

EPA believes the Draft Permit adequately protects Piscataqua EFH, and therefore additional mitigation is not warranted. If adverse impacts to EFH do occur as a result of this permit action, or if new information becomes available that changes the basis for this determination, then NMFS will be notified and consultation will be promptly initiated.

8. Endangered Species Act

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA) grants authority to and imposes requirements upon Federal agencies regarding endangered or threatened species of fish, wildlife, or plants ("listed species") and habitat of such species that has been designated as critical (a "critical habitat"). The ESA requires every Federal agency, in consultation with and with the assistance of the Secretary of Interior, to insure that any action it authorizes, funds, or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The United States Fish and Wildlife Service (USFWS) administers Section 7 consultations for freshwater species. The National Marine Fisheries Service (NMFS) administers Section 7 consultations for marine species and anadromous fish.

EPA has reviewed the federal endangered or threatened species of fish, wildlife, or plants to determine if any listed species might potentially be impacted by the re-issuance of this NPDES permit. The only listed species that may be present in the vicinity of Newington Energy is the shortnose sturgeon (*Acipenser brevirostrum*).

The shortnose sturgeon was placed on the original endangered species list in 1967 [32 Fed. Reg. 4001 (1967)] by the USFWS. Currently, the National Marine Fisheries Service (NMFS) has authority over this species under Section 4(a) (2) of the ESA, 16 U.S.C. Section 1533 (a) (2). At present, there are 19 recognized distinct population segments (Shortnose Sturgeon Recovery Plan, NMFS, 1998), which all remain listed as endangered.

The Shortnose Sturgeon Recovery Plan states that “There are no known shortnose sturgeon populations in the rivers between the Androscoggin and Merrimack rivers.” However, information contained in the NMFS Protected Resources website at <http://www.nmfs.noaa.gov/pr/species/fish/shortnosesturgeon.htm> lists the shortnose sturgeon as occurring in the Piscataqua River. In addition, the Atlantic States Marine Fisheries Commission, *Atlantic Sturgeon Stock Assessment, Peer Review Report*, March 1998, reported that “An occasional Atlantic sturgeon (Hoff 1980) has been captured in the Piscataqua River and two captures of shortnose sturgeon have been documented (New Hampshire Fish & Game 1989).”

Since a reproducing population of shortnose sturgeon is not likely to inhabit the Piscataqua River, only the juvenile and adult life stages would likely be found in the vicinity of Newington Energy. The location, design, construction, and capacity of the facility’s cooling water intake structure (CWIS) reflect the Best Technology Available (BTA) for minimizing adverse environmental impacts. Features of the CWIS include an approach velocities directly in front of the intakes that is no greater than 0.5 feet/second at any tidal stage. The use of a modified Ristroph screen design, including a high and low pressure screen wash system and fish return, maximize the probability of survival for impinged organisms. Also, the intake and fish return are located so as to reduce the chance of reimpingement. These features, along with effluent limitations and other permit conditions, are in place in this Draft Permit to minimize any adverse effects should there be any unanticipated incidental contact with shortnose sturgeon or any other listed species that may enter the Piscataqua River. Therefore, EPA has determined that Newington Energy’s operating conditions along with the limits and conditions in the Draft Permit are not likely to jeopardize the existence of listed species or their critical habitats. A copy of the Draft Permit and Fact Sheet has been provided to NMFS for review and comment as part of the notification required under ESA.

9. Monitoring

The effluent monitoring requirements have been established to yield data representative of the discharge under authority of Section 308(a) of the CWA as required by 40 C.F.R. 122.41 (j), 122.41 (j)(4), (5), 122.44 and 122.48.

Compliance monitoring frequencies mostly remained unchanged from those in the existing permit and were originally in accordance with the EPA/NHDES-WD Effluent Monitoring Guidance mutually agreed upon and first implemented in March 9, 1993 and last revised on July 19, 1999. The frequency of pH monitoring at Outfall 001 has been changed from “once per day” to “continuous” to better characterize the effluent.

WET test monitoring requirements are based on EPA-New England’s Municipal Toxicity Policy. Also retained in the Draft Permit, the sampling periods chosen to perform the quarterly WET tests are the 1st, 2nd, 3rd and 4th calendar quarters ending March 31st, June 30th, September 30th and December 31st, respectively, each year.

A provision retained in the Draft Permit allows the permittee to request a reduction in WET testing frequency (of no less than once per year) after completion of a minimum of four consecutive, valid WET tests that demonstrate compliance with the permit limits.

10. Antidegradation

This draft permit is being reissued with increases in the limits for flow (3.5 MGD to 4.0 MGD), temperature (90° F to 95° F) and salinity (60 ppt to 66 ppt). Newington Energy, LLC requested changes in their permit limits for these parameters to reflect the proposed operating parameters of the actual facility whereas the original permit limits were based on the predicted operational parameters before the facility was built. Recently, NH DES-WD and NH F&G reviewed additional monitoring and modeling information supplied by the facility and determined that the adjusted permit limits will be protective of the edge of the mixing zone temperature and salinity limits of 1.0° F and 1.0 ppt, respectively. *See* letter dated January 3, 2007 from Jeffrey G. Andrews, NH DES-WD to Ms. Sharon Zaya, EPA. EPA expects the State of New Hampshire, during the review of this draft permit as part of the State Certification process, to determine that there will be no lowering of water quality and no loss of existing water uses and that no additional antidegradation review is warranted.

11. State Certification Requirements

EPA may not issue a permit unless the State Water Pollution Control Agency with jurisdiction over the receiving water(s) either certifies that the effluent limitations and/or conditions contained in the permit are stringent enough to assure, among other things, that the discharge will not cause the receiving water to violate State's Surface Water Quality Regulations or waives its right to certify as set forth in 40 CFR §124.53.

Upon public noticing of the draft permit, EPA is formally requesting that the State's certifying authority make a written determination concerning certification. The State will be deemed to have waived its right to certify unless certification is received within 60 days of receipt of this request.

The New Hampshire Department of Environmental Services, Water Division is the certifying authority. EPA has discussed this draft permit with the Staff of the Wastewater Engineering Bureau and expects that the draft permit will be certified. Regulations governing state certification are set forth in 40 CFR §§124.53 and 124.55.

The State's certification should include the specific conditions necessary to assure compliance with applicable provisions of the Clean Water Act, Sections 208(e), 301, 302, 303, 306 and 307 and with appropriate requirements of State law. In addition, the State should provide a statement of the extent to which each condition of the draft permit can be made less stringent without violating the requirements of State law. Since certification is provided prior to permit issuance, failure to provide this statement for any condition waives the right to certify or object to any less

stringent condition which may be established by EPA during the permit issuance process following public noticing as a result of information received during that noticing. If the State believes that any conditions more stringent than those contained in the draft permit are necessary to meet the requirements of either the CWA or State law, the State should include such conditions and, in each case, cite the CWA or State law reference upon which that condition is based. Failure to provide such a citation waives the right to certify as to that condition. The sludge conditions implementing section 405(d) of the CWA are not subject to the 401 certification requirements.

Reviews and appeals of limitations and conditions attributable to State certification shall be made through the applicable procedures of the State and may not be made through the applicable procedures of 40 CFR Part 124.

12. Comment Period, Hearing Requests, and Procedures for Final Decisions

All persons, including applicants, who believe any condition of the Draft Permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to Sharon DeMeo, U.S. EPA, Office of Ecosystem Protection, Industrial Permits Branch, 1 Congress Street, Suite 1100, Boston, Massachusetts 02114-2023. Any person, prior to such date, may submit a request in writing for a public hearing to consider the Draft Permit to EPA and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public meeting may be held if the criteria stated in 40 C.F.R. § 124.12 are satisfied. In reaching a final decision on the Draft Permit, the EPA will respond to all significant comments and make these responses available to the public at EPA's Boston office.

Following the close of the comment period, and after any public hearings, if such hearings are held, the EPA will issue a Final Permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice. Within 30 days following the notice of the Final Permit decision, any interested person may submit a petition for review of the permit to EPA's Environmental Appeals Board consistent with 40 C.F.R. § 124.19.

13. EPA Contact

Additional information concerning the Draft Permit may be obtained between the hours of 9:00 A.M. and 5:00 P.M., Monday through Friday, excluding holidays from:

**Ms. Sharon DeMeo, Environmental Engineer
U.S. Environmental Protection Agency
Office of Ecosystem Protection
Industrial Permits Branch, Mail Code CIP
1 Congress Street, Suite 1100
Boston, Massachusetts 02114-2023
Telephone: (617) 918-1995
FAX No.: (617) 918-0995**

Date:

**Stephen S. Perkins, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency**

Attachment A-1: Newington Energy Facility



Newington Energy
Facility (NEF)

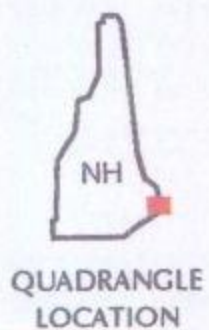
NEF Cooling Water
Intake Structure

NEF Discharge
Diffuser



BASE MAP IS A PORTION OF THE FOLLOWING 30' x 60' USGS
TOPOGRAPHIC-BATHYMETRIC QUADRANGLE: KITTERY, ME-NH, 1985

0 5,000 10,000
scale in feet



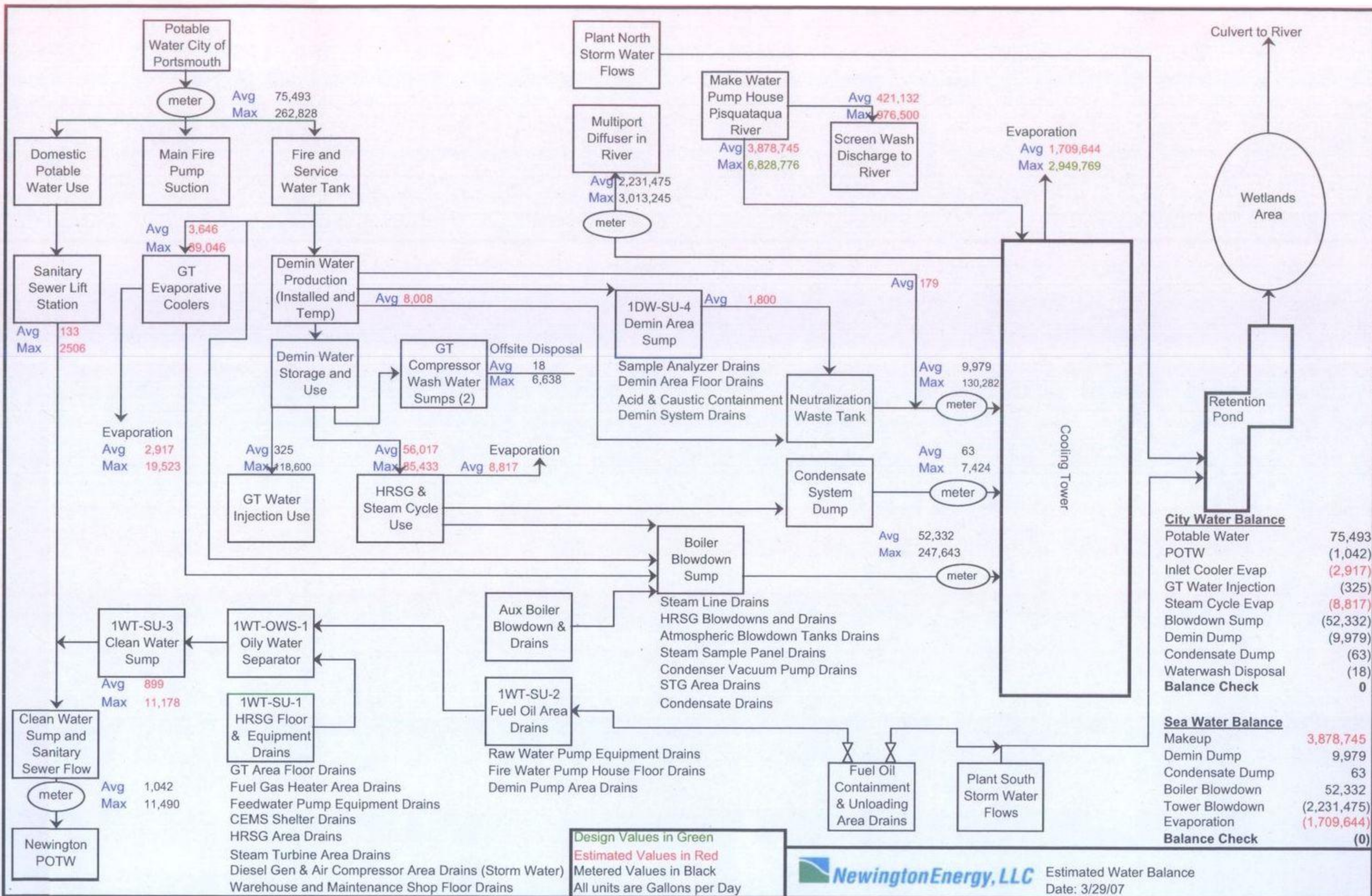
NEWINGTON POWER FACILITY

REGIONAL MAP

NEWINGTON ENERGY, L.L.C.

FIGURE 1.2-1

PROJ. NO. 23875



ATTACHMENT C -1 Outfall 001

NEWINGTON POWER FACILITY NPDES :NH0023361
OUTFALL # : 001

MONITORING

PERIOD END DATE	Temp MAX	Temp AVE	pH MIN	pH MAX	Salinity MAX	Salinity AVE	Zinc MAX	Zinc AVE	Cr MAX	Cr AVE	Flow MAX	Flow AVE	Chl- MAX	Chl- AVE
	°F	°F	s.u.	s.u.	ppm	ppm	mg/l	mg/l	mg/l	mg/l	MGD	MGD	mg/l	mg/l
30-Apr-06	77.35	67.21	7.9	8.2	51800	45783	0.083	0.082	not req		2.6	2.3	0	0
31-Mar-06	80	65	7.9	8.6	55500	43513	0.11	0.1	not req		3.4	3.1	0	0
28-Feb-06	81	68	7.9	8.4	53200	44276	0.079	0.079	not req		2.7	2	0	0
31-Jan-06	81	65	7.4	8.3	46800	37485	0.067	0	not req		3.2	2.6	0	0
31-Dec-05	86	69	7.9	8.3	48800	39794	0	0	not req		2.9	2.5	0	0
30-Nov-05	80	67	7.8	8.3	35673	28100	0	0	not req		3.2	2.6	0	0
31-Oct-05	86	68	7	8.2	52400	42086	0	0	not req		3.4	1.4	0	0
30-Sep-05	85	72	7.8	8.5	54600	47087	0	0	not req		3.4	2.6	0	0
31-Aug-05	88	78	7.8	8.6	55300	48760	0	0	not req		3.4	3.1	0	0
31-Jul-05	90	77	7.8	8.4	55000	45762	0	0	not req		3.3	2.8	0	0
30-Jun-05	89	75	7.8	8.3	53100	38481	0	0	not req		3	2.4	0	0
31-May-05	86	72	7.5	8.3	40600	34437	0	0	not req		3	2	0.35	0.02
30-Apr-05	82	70	7.7	8.2	42700	33553	0	0	not req		2.3	1.4	0.217	0.142
31-Mar-05	85	70	7.5	8.3	51200	45140	0	0	not req		2.3	1.9	0.1775	0.014
28-Feb-05	89	72	7.1	8.3	48200	38000	0.006	0.005	not req		2	1.8	0.117	0.007
31-Jan-05	88	72	7.4	8.2	49900	43292	0.009	0.009	0	0	1.8	1.6	0.19	0.02
31-Dec-04	88	72	7.9	8.3	47200	23500	0.012	0.011	0.01	0.01	2	1.7	0.17	0
30-Nov-04	88	72	7.7	8.2	47400	42628	0.008	0.007	0.01	0.01	2.9	1.9	0.2	0.02
31-Oct-04	88	72	7.4	8.1	55400	33200	not req		not req		2.5	1.2	0	0
30-Sep-04	88	72	7.2	8	58700	49923	not req		not req		3.2	2.8	0.1	0
31-Aug-04	88	72	7.8	8.1	52100	46210	not req		not req		3.5	1.9	0	0
31-Jul-04	88	72	7.9	8.3	54700	48414	not req		not req		3.4	3.1	0	0
30-Jun-04	88	72	7.5	8.2	51100	42622	not req		not req		3.4	3	0.2	0.01
31-May-04	84	66	6.9	8.2	47100	38728	not req		not req		3.3	2	0	0
30-Apr-04	76	64	7.8	8.3	41500	32644	not req		not req		3.2	2.7	0.4	0.1
31-Mar-04	82	68	7.7	8.3	56500	45545	not req		not req		2.4	2.9	0.2	0.1
29-Feb-04	78	67	7.6	8.3	48600	45355	not req		not req		2.9	2.5	0	0
31-Jan-04	81	67	7.9	8.2	30937	51200	not req		not req		2.7	2.2	0	0
31-Dec-03	84	68	7.3	8.1	53400	39414	not req		not req		2.6	2.2	0	0
30-Nov-03	77	63	7.1	7.9	45400	36909	not req		not req		2.3	0.5	0	0

31-Oct-03	76	64.8	7.2	7.7	52200	46709	not req	not req	3.3	0.3	0	0		
30-Sep-03	86	75	7.2	8	58700	50595	not req	not req	3.5	3.2	0.3	0.2		
31-Aug-03	85	77	7.3	7.9	54300	50363	not req	not req	3.5	3.4	0.2	0.1		
31-Jul-03	85	76	7.2	8	57000	51770	not req	not req	3.5	3.3	0.06	0.11		
30-Jun-03	85	73	7.4	8	56500	43710	not req	not req	3.3	1.9	0.2	0.2		
31-May-03	81	68	7.3	8	46800	40942	not req	46800 40942	2.9	2.3	0.1	0		
30-Apr-03	79	64	7.1	8	53400	33600	not req	not req	3.04	1.18	0.2	0		
31-Mar-03	75	65	7.1	7.9	49700	35065	not req	not req	3	2.6	0	0		
28-Feb-03	73	64	7	7.9	50100	39135	not req	not req	3	2.6	0	0		
31-Jan-03	69.8	63.1	6.55	7.94	57800	43188	not req	not req	2.8	3.1	0	0		
31-Dec-02	86.4	65.2	6.8	7.9	58400	41263	not req	not req	3	2.6	0.15	0.13		
30-Nov-02	86.37	65.2	6.52	7.57	54000	42972	not req	not req	3.03	2.69	0.24	0.16		
31-Oct-02	85.08	65.79	6.5	8	58000	43653	not req	not req	3.27	2.17	0.3	0.2		
30-Sep-02	86.79	74.74	6.7	8	58000	42225	not req	not req	3.2	2	0	0		
31-Aug-02	88.9	74.2	7	8	59800	47230	0	0	0	0	3.29	1.5	0	0
31-Jul-02	83.12	70.61	6.9	8	59000	38885	0.06	0.06	0	0	611064	71186	0	0
30-Jun-02	76.9	58.2	7.2	8.3	30100	27315	0.067	0.059	0	0	0.9495	2.9672	0	0
31-May-02	C = NO DISCHARGE													
30-Apr-02	C = NO DISCHARGE													
31-Mar-02	C = NO DISCHARGE													
28-Feb-02	C = NO DISCHARGE													
31-Jan-02	C = NO DISCHARGE													
31-Dec-01	45.1	41.5	7.91	8.15	29800	26966	not req	not req	1.02	0.38	0	0		
31-Dec-00	9 = MONITORING IS CONDITIONAL/NOT REQ T not req													
30-Nov-00	9 = MONITORING IS CONDITIONAL/NOT REQ T not req													
31-Oct-00	C = NO DISCHARGE													

2000 permit limits	90	Report	6.5	9	60,000	Report	1	1	0.2	0.2	3.5	3.5	0.5	0.2
Minimum	69.8	58.2	6.5	7.57	30100	23500	0	0	0	0	1.8	0.3	0	0
Maximum	90	78	7.9	8.6	59800	51770	0.11	0.1	0.01	0.01	3.5	3.4	0.4	0.2
Average	83.3981	69.32	7.38	8.15	51034.3	41499.2	0.024	0.02	0.01	0.01	2.974	2.2564	0.0866	0.033
Standard Deviation	4.87085	4.426	0.41	0.21	6876.43	6451.84	0.036	0.033	0	0	0.4459	0.7053	0.1152	0.062
#measurement	47	47	47	47	47	47	21	21	7	7	45	45	47	47
#exceed 2000 limits	0		0	0	0		0	0	0	0	0	0	0	0

shaded areas not used in calculations

ATTACHMENT C-2 Outfall 002

NEWINGTON POWER FACILITY NPDES :NH0023361
OUTFALL # : 002

MONITORING

PERIOD END

DATE	TSS MAX	TSS AVE	O&G MAX	O&G AVE	Flow MAX	Flow AVE
30-Apr-06	0	0	8	7.5	284033	107693
31-Mar-06	13.5	6.75	5	2.5	223764	66607
28-Feb-06	18	9	0	0	88559	57574
31-Jan-06	0	0	0	0	85963	51528
31-Dec-05	0	0	0	0	114698	59574
30-Nov-05	0	0	0	0	106718	55127
31-Oct-05	0	0	0	0	196512	32897
30-Sep-05	0	0	0	0	150465	52378
31-Aug-05	0	0	0	0	181385	66072
31-Jul-05	0	0	0	0	193242	54566
30-Jun-05	23	11.5	0	0	266668	59533
31-May-05	0	0	0	0	85482	53863
30-Apr-05	60	30	0	0	172498	76854
31-Mar-05	0	0	0	0	112766	61599
28-Feb-05	0	0	0	0	156163	70006
31-Jan-05	0	0	0	0	235108	57700
31-Dec-04	0	0	0	0	131263	101866
30-Nov-04	0	0	0	0	153424	64269
31-Oct-04	0	0	0	0	668999	113207
30-Sep-04	0	0	0	0	96184	56124
31-Aug-04	0	0	0	0	107517	52081
31-Jul-04	0	0	0	0	226504	75876
30-Jun-04	0	0	0	0	245004	66719
31-May-04	0	0	0	0	194947	66583
30-Apr-04	0	0	0	0	193217	53503
31-Mar-04	0	0	0	0	181008	46117
29-Feb-04	0	0	0	0	158793	60392
31-Jan-04	0	0	0	0	161906	54511
31-Dec-03	0	0	0	0	550077	122067
30-Nov-03	0	0	0	0	121555	44464
31-Oct-03	0	0	0	0	180190	58772
30-Sep-03	0	0	0	0	167773	41462
31-Aug-03	0	0	0	0	123723	31650
31-Jul-03	0	0	0	0	177862	34996
30-Jun-03	0	0	0	0	310705	64331
31-May-03	0	0	0	0	97010	23737
30-Apr-03	0	0	0	0	59204	22612
31-Mar-03	0	0	0	0	397611	42684
28-Feb-03	0	0	0	0	130187	31575
31-Jan-03	0	0	0	0	652508	99852
31-Dec-02	0	0	0	0	127392	10020
30-Nov-02	0	0	0	0	181287	10559
31-Oct-02	0	0	0	0	76291	12787
30-Sep-02	0	0	0	0	97523	79956

31-Aug-02	50	25	8	0.2	11729	43499
31-Jul-02	34	17	0	0	349897	9470
30-Jun-02	0	0	0	0	39369	7934
31-May-02	C = NO DISCHARGE					
30-Apr-02	C = NO DISCHARGE					
31-Mar-02	C = NO DISCHARGE					
28-Feb-02	C = NO DISCHARGE					
31-Jan-02	C = NO DISCHARGE					
31-Dec-01	C = NO DISCHARGE					
28-Feb-01	9 = MONITORING IS CONDITIONAL/NOT REQ THIS MP					
31-Dec-00	9 = MONITORING IS CONDITIONAL/NOT REQ THIS MP					
30-Nov-00	9 = MONITORING IS CONDITIONAL/NOT REQ THIS MP					
31-Oct-00	9 = MONITORING IS CONDITIONAL/NOT REQ THIS MP					
30-Sep-00	9 = MONITORING IS CONDITIONAL/NOT REQ THIS MP					

maximum	668999	122067
average	192014.5319	55047.78723